



Intellectual Capital and Firm Value in Indonesian Insurance Companies: The Role of Profitability Mediation and Underwriting Risk Moderation

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Abstract

Background: The Indonesian insurance industry faces increasing pressure to leverage intellectual capital (IC) for competitive advantage, yet evidence on its impact on profitability and firm value remains limited and inconsistent.

Objective: This study examines the effect of intellectual capital, measured by the Adjusted Value-Added Intellectual Coefficient (A-VAIC), on the firm value of insurance companies in Indonesia, and investigates the role of profitability as a mediating variable and underwriting risk as a moderating variable.

Methods: Using a quantitative approach, panel data from 14 Indonesian insurance companies listed on the Indonesia Stock Exchange over 2019–2024 were analyzed (84 firm-year observations) employing Seemingly Unrelated Regression (SUR), Moderated Regression Analysis (MRA), and Sobel test.

Results: The results indicate that intellectual capital has no significant effect on profitability ($\beta = -0.000509$; $p = 0.696$) but has a significant negative effect on firm value ($\beta = -0.155$; $p = 0.027$). Profitability (ROA) has no significant effect on firm value (PBV) ($\beta = -16.02$; $p = 0.062$). Underwriting risk (loss ratio) significantly weakens the IC–profitability relationship ($\beta = -0.000146$; $p = 0.003$), while profitability does not mediate the IC–firm value relationship (Sobel $z = 0.392$; $p = 0.695$). These findings suggest that IC effectiveness is contingent on underwriting risk management and that IC information is not yet fully interpreted by the market. Practically, insurance firms should prioritize underwriting efficiency and transparent IC disclosure to enhance market valuation.

Conclusion: The findings show that intellectual capital has a significant negative effect on firm value, while profitability does not mediate this relationship. Underwriting risk weakens the effect of intellectual capital on profitability, indicating that its value is not yet fully recognized by the market.

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INTRODUCTION

The development of the global economy in the last two decades shows a fundamental paradigm shift from a resource-based economy to a knowledge-based economy that is increasingly developing towards a digital economy and innovation economy (Stehr et al. 2020). This transformation is marked by an increase in the contribution of the knowledge-based services sector which reaches 65–70% of the total GDP of developed countries (World Economic Forum). In a knowledge-based economic system, the main resources that drive growth are no longer solely physical assets and natural resources, but knowledge, innovation, technology, and the quality of human resources. This shift requires companies to manage and optimize Intellectual Capital (IC)

as a strategic asset in creating value and increasing competitiveness (Bansal et al., 2023). Global evidence further supports this view: the intangible asset share of the S&P 500 market value has grown from approximately 17% in 1975 to over 90% in 2020 Ocean (2020), while intellectual capital in the financial services sector contributes an estimated 30–40% of market value added in advanced economies.

In Indonesia, the issue of IC management is increasingly relevant along with the structural transformation of the national economy. The total assets of the national insurance industry reached IDR 1,133.87 trillion as of December 2024, an increase of 2.03% compared to the same period the previous year, with gross premium growth reaching IDR 336.65 trillion (Ahdia, 2025). However, the insurance penetration rate is only 2.61% in 2024, a decrease compared to the previous year, and still far below the achievements of neighboring countries such as Malaysia (4.8%) and Singapore (11.4%) (Al Ishaqi, 2024). Amid increasingly intensive industrial competition, insurance companies can no longer rely solely on the strength of financial capital. Sustainable competitive advantage is increasingly determined by IC which includes human capital, structural capital, capital employed, and relational capital (Ulum, 2017).

Pulic (2000) introduced the Value-Added Intellectual Coefficient (VAIC) model as a method of measuring IC efficiency that has been widely used in empirical research (Ayinaddis et al., 2024; Olarewaju & Msomi, 2021). However, some researchers criticize the limitations of conventional VAIC in capturing the complexity of the entire IC dimension, especially in heavily regulated industries with unique risk characteristics such as insurance (Abuaddous et al., 2023) Bansal et al., 2024). To overcome these limitations, Adjusted VAIC (A-VAIC) was developed which integrates Relational Capital Efficiency (RCE) as the fourth component (Vishnu & Gupta, 2014). The characteristics of a trust-based insurance business make the quality of risk assessment, accuracy of premium determination, the efficiency of the claims process, and the strength of reputation and distribution network as determinants of competitive advantage (Ahmad & Abbas, 2024).

An interesting phenomenon is that there is a gap between the growth of the insurance industry and the market valuation of insurance companies listed on the Indonesia Stock Exchange (IDX). Although total assets and gross premiums showed growth, many insurers experienced a decline in Price to Book Value (PBV) during the 2019–2024 period. Specifically, the average PBV of IDX-listed general insurers declined from 1.72 in 2019 to 1.21 in 2021 before partially recovering to 1.43 in 2024, reflecting persistent undervaluation relative to book assets. This condition indicates that operational growth has not been fully appreciated by the market, which may be due to limited disclosure regarding ICs, market concerns about the quality of underwriting, and volatility in investment returns due to capital market dynamics. The COVID-19 pandemic has also put significant pressure on the performance of insurance companies, particularly in the health and general lines, with a surge in claims and volatility in the value of investment assets.

Research on the influence of IC on insurance company valuations in Indonesia is still relatively limited, and the results have not been consistent. Several studies have found a positive influence of IC on profitability and valuation Eneh (2025) and Essel (2025), while other studies have shown insignificant or even negative results (Rehman, 2020; Rosario, 2023). This inconsistency indicates the existence of contingency factors that need to be considered, including the role of profitability as a mediator and the risk characteristics of the insurance industry as a moderator (Ahmad & Abbas, 2024; Ningsih & Leon, 2024).

A critical synthesis of these contradictory findings reveals three patterns: (a) studies conducted in advanced market economies Essel (2025) in Ghana; Olarewaju (2021) in South Africa tend to find positive IC-performance relationships, suggesting that institutional quality and market depth moderate IC effectiveness; (b) studies employing only three-component VAIC models systematically underestimate IC's relational dimension, introducing measurement bias; and (c) the absence of risk controls in most prior studies conflates IC performance with industry-wide underwriting cycles, inflating or deflating estimated IC coefficients depending on the observation period.

Previous research has generally focused on the manufacturing or banking sector and uses a conventional VAIC model that includes only three components of efficiency, so it has not been able to capture the crucial dimension of relational capital in the insurance industry. Three distinct

gaps can be identified: (1) a theoretical gap, as existing frameworks have not adequately addressed how IC dimensions interact with industry-specific risk in the insurance sector; (2) an empirical gap, as studies focusing on Indonesian general insurance companies using A-VAIC are virtually absent; and (3) a methodological gap, as simultaneous testing of mediation and moderation with robust SUR estimation remains unexplored in this context.

This study aims to fill this gap by analyzing the influence of IC measured using A-VAIC on the valuation of insurance companies in Indonesia, considering the role of profitability (ROA) as a mediating variable and underwriting risk (loss ratio) as a moderation variable. The novelty of the research lies in three aspects: first, the use of the A-VAIC model that integrates the four components of IC efficiency (HCE, SCE, CEE, and RCE, which is more comprehensive and in accordance with the characteristics of the insurance industry) specifically, A-VAIC extends conventional VAIC by incorporating Relational Capital Efficiency (RCE), which captures premium income generation and distribution network strength, dimensions that are critical in the trust-based insurance business but absent in the three-component VAIC model; second, simultaneous testing of the role of profitability mediation and underwriting risk moderation; third, the 2019–2024 observation period covering pre-pandemic, pandemic, and post-COVID-19 pandemic dynamics.

Literature Review and Hypothesis Development

Theoretical Studies

This research is based on three main theories, namely Resource-Based View (RBV), Signaling Theory, and Agency Theory. The RBV proposed by Barney (1991) states that sustainable competitive advantage comes from resources that meet the VRIN criteria—valuable, rare, inimitable, non-substitutable. IC as a strategic resource meets these criteria so that it is able to produce a competitive advantage that is difficult for competitors to imitate. In the context of the insurance industry, IC is the main determinant of competitive advantage because of the uniqueness of the insurance business which relies on actuarial expertise, underwriting skills, and quality of relationships with customers.

The Signaling Theory developed by Spence (1978) explains that in conditions of information asymmetry, profitability and performance of ICs function as credible signals that communicate the quality of the company to external investors, thereby influencing market valuation (Bergh et al., 2019). External investors have limitations in observing the quality of ICs directly because most IC components are intangible. Agency Theory formulated by Jensen (2019) states that profitability reflects the effectiveness of management (agent) in managing resources to maximize the wealth of shareholders (principal). In the insurance industry, the role of the agency mechanism is crucial because investors and policyholders have a common interest in ensuring that management manages premium funds prudently (Syafriadi et al., 2023).

Company Valuation, Profitability, Intellectual Capital, and Underwriting Risk

A company's valuation reflects the market's assessment of the company's overall value which includes tangible and intangible assets. Price to Book Value (PBV) is the ratio between the market price of a stock and the book value per share, which reflects the market's appreciation of intangible assets including ICs (Akbar & Nusa, 2022). Profitability is proxied with Return on Assets (ROA) because it is not distorted by the capital structure, focuses on asset efficiency that is relevant to the insurance business that depends on the management of investment assets, and is comparable between companies with different capital structures (Rosario, 2023).

IC represents a paradigm shift towards the recognition that intangible assets are the main drivers of competitive advantage (Stewart, 2010). Pulic (2000) developed VAIC as an IC measurement model with three components: Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE). To overcome the limitations of conventional VAIC, A-VAIC refines VAIC by integrating RCE so that it includes four efficiency dimensions: $A\text{-}VAIC = HCE + SCE + CEE + RCE$ (Vishnu & Gupta, 2014). Underwriting risk is the core risk of the insurance business related to the risk selection process, premium determination, and claim evaluation. The loss ratio, which is the ratio of claims expense to premium income, reflects the effectiveness of underwriting and risk control.

Hypothesis Development

The Influence of Intellectual Capital on Profitability. Based on RBV, IC as a strategic resource increases the company's ability to generate profits (Barney, 1991). In the insurance industry, high HCE increases technical profitability; Efficient SCE lowers expense ratio; Optimal CEE increases investment income; and strong RCE driving premium growth (Essel, 2025). Research by Ayinaddis (2024) and Olarewaju (2021) shows that IC has a positive effect on the profitability of insurance companies. Thus:

H1: Intellectual Capital as measured by A-VAIC has a positive effect on the profitability of insurance companies in Indonesia.

The Effect of Profitability on Company Valuation. Based on Signaling Theory, high profitability serves as a positive signal for investors regarding the company's performance and prospects, thereby increasing valuation (Spence, 1978). Research by Handayani (2019) and Akbar (2022) shows that profitability has a positive effect on firm value. Thus:

H2: Profitability has a positive effect on the valuation of insurance companies in Indonesia.

The Influence of Intellectual Capital on Company Valuation. Based on Intellectual Capital Theory, a company's market value reflects the value of IC that is not recorded in the book value (Stewart, 2010). Habib (2024) show that IC has a positive effect on market valuation. However, it is notable that a subset of studies reports negative or insignificant IC-valuation relationships in regulated and emerging market contexts Rehman (2020) and Odat (2025), suggesting that the direction of the effect may depend on institutional transparency, IC disclosure quality, and market depth. Thus:

H3: Intellectual Capital as measured by A-VAIC has a positive effect on the valuation of insurance companies in Indonesia.

Underwriting Risk Moderates IC Relationships and Profitability. High underwriting risk reflects adverse selection, inadequate pricing, or weak claims control, which reduces IC's effectiveness in generating profitability. The research of Ahmad (2024) and Ningsih (2024) indicates a negative interaction between risk and effectiveness of IC. Thus:

H4: Underwriting risk proxied with loss ratio weakens the influence of Intellectual Capital on the profitability of insurance companies in Indonesia.

Profitability Mediates the Influence of IC on Valuation. The synthesis of Signaling Theory and Agency Theory justifies the role of profitability as a transmission mechanism: IC increases profitability, and profitability increases valuation through signaling and agency cost reduction (Jensen, 2019; Spence 1978). Thus:

H5: Profitability mediates the influence of Intellectual Capital on the valuation of insurance companies in Indonesia.

METHOD

This study used a quantitative approach with a causal-associative research design to test the relationships among variables. The research population consisted of general insurance and reinsurance companies listed on the IDX during the 2019–2024 period. The sample was selected using the purposive sampling method based on the following criteria: (1) general insurance or reinsurance companies listed on the IDX; (2) companies that consistently published complete financial statements during 2019–2024; and (3) companies with available data for all variables. Based on these criteria, 14 companies were obtained, with a total of 84 firm-year observations. The six-year observation period was chosen to cover pre-pandemic (2019), pandemic (2020–2021), and post-pandemic recovery (2022–2024) dynamics.

IC was measured using A-VAIC, which is an aggregate of four efficiency components: HCE (VA/HC), SCE ((VA – HC)/VA), CEE (VA/CE), and RCE (RC/VA). Value Added (VA) was calculated as the difference between output and input. Profitability was proxied by ROA (net profit / total assets). Underwriting risk was proxied by the loss ratio (claim expense / premium income). Firm valuation was proxied by PBV (market price per share / book value per share). The data were transformed using the reverse-score method with the formula $X_{rev} = \text{Maximum Value} - X + 1$ to standardize the direction of interpretation (Hair et al., 2019; Kline, 2016).

Specifically, the reverse-score transformation was applied to the PBV and ROA variables because of their extreme skewness (skewness: PBV = 5.65; ROA = –3.37), which violated the normality assumption. The reversal preserves ordinal rankings while reducing the influence of

outliers, and the transformed scores are interpreted such that lower reversed values correspond to higher original values. Sensitivity analyses comparing results with and without transformation confirmed consistent directional findings, supporting the robustness of the approach. Endogeneity between IC and profitability was assessed using the Durbin-Wu-Hausman test; the nonsignificant result ($p > 0.10$) suggests that endogeneity is not a material concern in this dataset.

Table 1. Variable Operational Definition

Variable	Proxies	Measurement	Scale
Independent – Intellectual Capital	A-VAIC	HCE + SCE + CEE + RCE	Ratio
Mediation – Profitability	ROA	Net Profit / Total Assets	Ratio
Moderation – Underwriting Risk	Loss Ratio	Claim Expense / Premium Income	Ratio
Dependents – Company Valuation	PBV	Stock Market Price / Book Value per Share	Ratio

Source: Developed for this research (2026)

Data Analysis Techniques

The analysis was carried out using panel data regression with EViews 12 software. The stages of analysis include: (1) descriptive statistics; (2) model selection through Chow Test (CEM vs FEM), Hausman Test (FEM vs REM), and Lagrange Multiplier Test (CEM vs REM); (3) classical assumption test; (4) model estimation using robust Seemingly Unrelated Regression (SUR) on heteroscedasticity, autocorrelation, and correlation between residuals (Osemeke et al., 2024; Youssef et al., 2022); (5) hypothesis test through partial test (t-test) and determination coefficient (R^2); (6) Moderated Regression Analysis (MRA) with A-VAIC $\times$ Loss Ratio (AVLR) interaction variables to test the moderation effect; and (7) Sobel test to test the mediation effect.

The research model consists of:

Model 1 (mediator-moderator): $ROA = \beta_0 + \beta_1 \text{A-VAIC} + \beta_2 \text{Loss Ratio} + \beta_3 (\text{A-VAIC} \times \text{Loss Ratio}) + \varepsilon$

Model 2 (direct effect of IC on valuation): $PBV = \beta_0 + \beta_1 \text{A-VAIC} + \varepsilon$

Model 3 (effect of profitability on valuation): $PBV = \beta_0 + \beta_1 \text{ROA} + \varepsilon$

RESULTS AND DISCUSSION

Results

Sample Overview and Descriptive Statistics

The research sample consists of 14 general insurance and reinsurance companies listed on the IDX with 84 firm-year observations during 2019–2024. Table 2 presents the descriptive statistics of the four research variables.

Table 2. Descriptive Statistics of Research Variables

Statistics	PBV	A-VAIC	Loss Ratio	ROA
Mean	1,4724	2,3712	54,5165	0,0146
Median	0,7550	2,3308	56,5387	0,0189
Maximum	21,7100	9,9466	114,2930	0,0767
Minimum	0,0600	-3,2879	1,9222	-0,1983
Std. Dev.	3,1562	1,7770	22,7453	0,0347
Skewness	5,6496	0,4412	-0,2214	-3,3725
Kurtosis	35,1196	7,8826	3,4974	19,6981
Observations	84	84	84	84

Source: Data processed, 2026

The PBV variable has an average value of 1.4724 with a standard deviation of 3.1562 and a range of 0.06–21.71, indicating wide valuation variations between companies. Skewness values of 5.6496 and kurtosis of 35.1196 indicate an abnormal distribution. A-VAIC has an average of 2.3712 (SD = 1.7770) with a range of -3.29 to 9.95, indicating IC efficiency heterogeneity. The average loss ratio of 54.52% (SD = 22.75) with a range of 1.92–114.29% reflects the heterogeneity

of underwriting quality between companies. An average ROA of 1.46% (SD = 3.47%) with a negative minimum value indicates that there is a company that has suffered losses. High values of skewness and kurtosis in PBV and ROA indicate abnormal distributions, which are addressed through reverse score transformation and SUR estimation.

Model Selection and Classical Assumption Test

The Chow test for Model 1 (ROA) shows a p-value of $0.0002 < 0.05$ so FEM is more accurate than CEM. The Hausman test showed a p-value of $0.0803 > 0.05$ so REM was selected. The LM Breusch–Pagan test with a cross-section p-value of $0.0081 < 0.05$ confirmed the REM selection. For the Model 2 and Model 3 (PBV), the Chow test showed FEM preferred (p-value < 0.05), but the Hausman test p-value > 0.05 (0.0683 for Model 2; 0.3934 for Model 3) so REM was selected for both models.

The classical assumption test showed several violations: the normal undistributed residual (Jarque–Bera p-value < 0.05 in the entire model), controlled multicollinearity (the correlation of A-VAIC and ROA = $0.8313 < 0.9$ as the critical limit), heteroscedasticity in Model 3 (p-value ROA = $0.0165 < 0.05$), and positive autocorrelation in Models 2 and 3 (Durbin–Watson = 0.4872 and 0.5301, both smaller than $dL = 1.597$). As per Wooldridge (2010), violation of normality is not a prerequisite for estimators of data panels to remain consistent and efficient because of the Central Limit Theorem for $N > 30$. To overcome other assumption violations, a robust Seemingly Unrelated Regression (SUR) method is used for heteroscedasticity, autocorrelation, and inter-residual correlation (Osemeke et al., 2024; Youssef et al., 2022).

Hypothesis Test Results

Table 3 presents the results of Model 1 estimation that tests the effect of IC on ROA by moderation of loss ratio.

Table 3. Model 1 Partial Test Results (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
A-VAIC	-0,000509	0,001275	-0,399099	0,6963
Loss Ratio	0,001022	0,000363	2,819338	0,0145**
AVLR (A-VAIC × Loss Ratio)	-0,000146	0,000040	-3,637461	0,0030**
R-squared	0,509241			

Source: Data processed, 2026. **Significant at $\alpha = 0.05$

Model 1 results showed that A-VAIC had no significant effect on ROA (coefficient = -0.000509; p-value = $0.6963 > 0.05$), so H1 is subtracted. The Loss Ratio variable showed a significant positive influence on ROA (coefficient = 0.001022; p-value = $0.0145 < 0.05$), which indicates that at some point, well-managed underwriting risk exposure can contribute to increased profitability through premium income. The A-VAIC interaction variable × Loss Ratio (AVLR) was significant with a negative coefficient (-0.000146; p-value = $0.0030 < 0.05$), which means that the loss ratio weakens the relationship between IC and profitability, so H4 is accepted. An R^2 value of 0.5092 indicates that the model can explain 50.92% of the ROA variation. In terms of effect size, Cohen's f^2 for the moderation effect (AVLR) is 0.18, indicating a medium practical effect. The Akaike Information Criterion (AIC) for Model 1 with moderation is lower than the baseline model without the interaction term ($\Delta AIC = -6.3$), confirming improved model fit.

Table 4. Partial Test Results of Model 2 (Effect of A-VAIC on PBV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11,23125	0,494658	22,70508	0,0000
A-VAIC	-0,154928	0,061953	-2,500744	0,0266**
R-squared	0,277937			

Source: Data processed, 2026. **Significant at $\alpha = 0.05$

The results of Model 2 showed that A-VAIC had a significant effect on PBV with a negative coefficient (-0.154928; p-value = $0.0266 < 0.05$). This negative direction is contrary to the hypothesis that states a positive influence, so H3 is rejected. These results indicate that the market

has not fully appreciated the efficiency of insurance companies' ICs in Indonesia.

Table 5. Partial Test Results of Model 3 (Effect of ROA on PBV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	185,0767	85,86039	2,155554	0,0504
ROA	-16,02383	7,862683	-2,037960	0,0624
R-squared	0,156950			

Source: Data processed, 2026

The results of Model 3 showed that ROA had a coefficient of -16.0238 with a p-value of 0.0624 which was greater than the significance level of 0.05, so that ROA had no significant effect on PBV. Thus, H2 was rejected. The R^2 value of 0.1570 indicates that the model's ability to explain PBV variation is relatively low (15.70%). This low explanatory power indicates that ROA alone is an insufficient predictor of insurance firm valuation, suggesting that PBV is driven by a broader set of factors beyond accounting profitability, including risk-adjusted capital metrics, solvency ratios, and investor sentiment toward the sector.

Table 6. Sobel Test Results (Mediation Test)

Parameter	Value
Sobel z-statistic	0,3918
Std. Error	0,02082
p-value	0,6952
z-table ($\alpha = 0.05$)	± 1.96
Conclusion	Insignificant

Source: Data processed, 2026

The results of the Sobel test showed a value of $z = 0.3918$ with a p-value of $0.6952 > 0.05$, so H5 was rejected. Profitability cannot mediate the influence of IC on a company's valuation.

Table 7. Summary of Hypothesis Test Results

Hyp.	Statement	Results
H1	IC (A-VAIC) has a positive effect on profitability (ROA)	Rejected
H2	Profitability (ROA) has a positive effect on valuation (PBV)	Rejected
H3	IC (A-VAIC) has a positive effect on valuation (PBV)	Rejected
H4	Underwriting risk weakens IC's relationship and profitability	Accepted
H5	Profitability mediates the influence of ICs on valuation	Rejected

Source: Data processed, 2026

Discussion

The Influence of Intellectual Capital on Profitability

The results showed that A-VAIC had no significant effect on ROA, so H1 was rejected. These findings are in line with Riady (2019), Rehman (2020) and Rosario (2023), who stated that the components of ICs (HCE, SCE, CEE, RCE) have not always shown a significant influence on ROA because the improvement of skills, systems, and external relationships has not had a real impact on the company's profitability. Based on Resource-Based Theory, intellectual capital does not automatically improve financial performance if these resources have not been used strategically (Rehman, 2020). This is also evidenced by the fluctuating A-VAIC value and tends to decrease from 1.99 in 2019 to 1.35 in 2023, before increasing again to 1.63 in 2024 (Ali et al., 2022).

Several contextual factors explain these findings. First, the observation period included the COVID-19 pandemic which put great pressure on insurance financial performance, with a surge in claims and investment volatility eroding profits. Second, the heavily regulated nature of the insurance industry limits the company's flexibility in optimizing IC to profit. Third, IC investments take a time-lag to convert into profitability, while a six-year period may not be enough to capture these effects (Tamragundi, 2025). Fourth, insurance companies in Indonesia are generally still in the digital transformation stage, so investment in the system tends to increase operational costs in the short term before generating long-term efficiencies. A study limitation of

the current research is the absence of explicit variables measuring digital transformation intensity, technology investment scale, and organizational maturity. Future studies should incorporate digital capability indices or IT investment ratios as control variables to disentangle digital transformation effects from broader IC efficiency measures (Bharadwaj, 2000; Weill & Woerner, 2018).

The Effect of Profitability on Company Valuation

The test results showed that ROA had no significant effect on PBV ($p\text{-value} = 0.0624 > 0.05$) with a negative coefficient direction, so H2 was rejected. These findings are in line with Sugianto (2018) who show that short-term profitability is not always the main determinant of a company's value. In the insurance industry, PBV reflects investors' perception of long-term prospects, asset quality, and risk profile rather than one-period accounting earnings (Wulandari & Roslina, 2023).

Several possibilities explain these findings. First, increased ROA stemming from short-term strategies or non-operational activities can be perceived by the market as less sustainable. Second, there is quality-of-earnings concern where the market doubts the sustainability of profits due to the volatility of underwriting and investment results. Third, in the insurance industry, the market tends to give greater weight to risk-based and solvency-based indicators than accounting profitability because the ability of companies to cover long-term liabilities is considered more critical. From a capital market theory perspective, insurance investors in emerging markets such as Indonesia tend to price stocks based on asset quality, regulatory capital adequacy, and growth options rather than near-term earnings. The negative coefficient direction of ROA on PBV is also consistent with the overinvestment hypothesis, wherein firms with temporarily high ROA may be perceived as having limited reinvestment opportunities, depressing market valuations.

The Influence of Intellectual Capital on Company Valuation

The results of the study found that A-VAIC had a significant negative effect on PBV, which is contrary to the H3 hypothesis. SCE negatively affects PBV when system investment is inefficient, as well as Odat (2025) who show rigid organizational structures and system investments that have not made a real economic contribution. From the perspective of Signaling Theory, these findings indicate a failure of the signaling mechanism: the market has not been able to observe the quality of ICs directly due to the limitations of IC disclosure in the annual reports of Indonesian insurers.

Habib (2024) research in the context of emerging markets shows that the influence of IC on valuation is conditioned by the quality of governance and transparency of reporting. In Indonesian insurers, IC disclosures are still not standardized and are mostly narrative without verifiable quantitative indicators, so IC information cannot be interpreted effectively by investors. This condition causes the market to tend to give discounts to companies with high IC investments due to uncertainty regarding the quality of the investment conversion. Theoretically, this negative IC–PBV relationship can be interpreted through three complementary lenses. First, from a resource misallocation perspective Penrose (1959), IC investments in Indonesian insurers may be concentrated in non-productive areas or duplicative systems that inflate capital expenditure without commensurate value creation. Second, from an information asymmetry lens Akerlof (1970), investors discount IC-intensive firms because they cannot verify the quality or future payoff of these investments, leading to a “market for lemons” dynamic in IC valuation. Third, the negative coefficient may reflect a value-relevance problem specific to Indonesia's capital market, where retail investors dominate and tend to rely on price momentum and dividend signals rather than IC fundamentals. This finding constitutes a key theoretical contribution of this study, challenging the universal applicability of the IC-valuation nexus posited by Pulic (2000) and Stewart (2010) in regulated industry contexts.

Risk of Underwriting Moderating the Relationship of ICs and Profitability

The moderation effect of the loss ratio proved to be significant in a negative direction, so H4 was accepted. These findings confirm that the effectiveness of ICs is heavily influenced by a company's ability to control its core business risks. Companies with high loss ratios—which reflect adverse selection, underpricing, or weak claims control—experience a decrease in the

effectiveness of IC conversion to profit because resources are sucked up to close claims and increase technical reserves (Ningsih & Leon, 2024; Ullah et al., 2016).

Mechanistically, a high loss ratio weakens the IC-ROA relationship through three pathways. First, resource drain: funds that should have been allocated for IC investments are diverted to claim payments. Second, managerial distraction: management focuses on claims settlement and damage control, reducing attention to long-term capability development. Third, the reputation effect: a prolonged high loss ratio damages the reputation which is a component of relational capital. These findings are in line with Ahmad (2024) on Pakistani insurance and are even more relevant given the heterogeneity of underwriting quality reflected in the very wide range of loss ratios (1.92%–114.29%).

Profitability Does Not Mediate the Influence of ICs on Valuation

The results of the Sobel test showed that profitability did not mediate the influence of IC on valuation, so H5 was rejected. This failure of mediation is caused by two main factors. First, A-VAIC had no significant effect on ROA (path a was not significant), so Baron (1986) mediation prerequisites were not met. Second, ROA has no significant effect on PBV with a negative coefficient direction, which indicates short-term profitability is not a positive signal for investors in assessing insurance companies.

Theoretically, these findings suggest the need to re-conceptualize the mechanism of value transmission in the insurance industry. Insurance company valuations seem to be more influenced by other factors such as risk-based capital, reserve quality, solvency, and sustainability perception than accounting profitability. Alternative mediator variables that are more relevant to future research may include economic value added (EVA), combined ratio, or risk-adjusted return on capital (RAROC).

Managerial Implications

Based on the findings, there are five managerial implications that can be formulated. First, companies need to reorient their Intellectual Capital management by emphasizing real value creation through investments in human resources, organizational systems, and external relationships that truly contribute to improved operational performance and innovation. Second, management needs to optimize non-profitability factors in increasing valuation, such as growth prospects, business stability, risk management, and governance quality, through strengthening investor relations strategies. Third, companies need to strengthen their underwriting function through the principle of prudence, improving the quality of risk analysis, using data-based technology, Enterprise Risk Management (ERM), and appropriate reinsurance strategies. Fourth, companies need to improve the quality of IC-related information disclosure and business strategies to reduce the perceived gap between management and the market. Fifth, companies need to evaluate business strategies by focusing not only on increasing short-term profits, but also creating long-term value through innovation, market expansion, and increased competitiveness.

CONCLUSION

This study empirically examines the influence of Intellectual Capital measured by A-VAIC on the valuation of insurance companies in Indonesia, with profitability as a mediator and underwriting risk as a moderator in the 2019–2024 period. The results of the study concluded: (1) A-VAIC had no significant effect on profitability (ROA); (2) ROA has no significant effect on the company's valuation (PBV); (3) A-VAIC has a significant negative effect on PBV, which indicates that IC efficiency has not been perceived as a positive signal by investors; (4) underwriting risk proxied by loss ratios has been shown to weaken the relationship between IC and profitability; and (5) profitability is unable to mediate the relationship between IC and company valuation.

These findings indicate that the effectiveness of ICs in Indonesian insurers is still limited by underwriting risk conditions, and has not been fully appreciated by the market in the formation of company value. The primary theoretical contribution of this study is the empirical demonstration that the IC-valuation nexus is not universally positive in regulated industries, challenging the assumptions of conventional IC theory and signaling theory in the Indonesian insurance context. Specifically, the negative IC-PBV relationship suggests that disclosure opacity and market information asymmetry are first-order moderators of IC's value relevance. From a

policy perspective, regulators such as OJK should consider mandating standardized IC disclosure frameworks for listed insurers to reduce information asymmetry and improve market valuation accuracy. Future research is recommended to: (1) incorporate digital transformation and organizational maturity variables as additional controls; (2) extend the sample to include life insurance and multi-line insurers; (3) apply alternative mediators such as EVA or RAROC; and (4) use dynamic panel methods (GMM) to address potential endogeneity over longer observation windows.

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AUTHOR CONTRIBUTION STATEMENT

Author 1: Conceptualization, Methodology, Data Curation, Formal Analysis, Writing—Original Draft. Author 2: Literature Review, Validation, Writing—Review & Editing, Supervision. All authors have read and agreed to the published version of the manuscript.

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